

REMARKS

The last Office Action has been carefully considered.

It is noted that claims 1-7 are rejected under 35 U.S.C. 103(a) over the patent to Ritter or applicant's review of the prior art, then taken with the patent to Wang.

After carefully considering the Examiner's grounds for the rejection of the claims over the art, applicants have canceled claims 2 and 3 and amended claim 1, the broadest claim on file, so as to more clearly define the present invention and to distinguish it from the prior art.

It is believed to be advisable before the analysis of the prior art to explain to the Examiner the subject matter of the present invention. In accordance with the present invention a seismic sensor is provided which includes an immovable plate connected with a case of the sensor and a movable plate which moves relative to the immovable plate and also relative to the casing and is made as a flexible diaphragm. The flexible diaphragm moves exclusively under the action of displacement of the case when the sensor is located for example in the ground and the whole sensor is subjected to a seismic activity.

Thus, when the seismic activity acts on the sensor as a whole and the case moves, the flexible movable diaphragm moves relative to the immovable plate. This sensor is completely different from the acoustic sensors. In the acoustic sensors if the acoustic sensor is used in a medium and is displaced, for example an acoustic microphone, the main objective is to make sure that there will be no movement of the movable plate relative to the immovable plate to avoid any interference with a sound. The movable plate in an acoustic sensor or in an acoustic microphone is displaced exclusively under the action of air waves caused by an acoustic activity. Thus, an acoustic sensor can not be compared with the seismic sensors.

In accordance with the present invention, the sensitivity of the seismic sensor is improved by arranging a mass, formed for example as a lug, on the flexible moveable diaphragm which extends over the total cross-section of the sensor inside the case, so that when the sensor is moved as a whole under the action of the seismic activity and the flexible diaphragm is displaced relative to the immovable plate in response to the displacement of the sensor as a whole, the lug located in the center of the flexible diaphragm enhances the displacement of the flexible diaphragm (which is many times thinner than the immovable plate and has a significantly higher flexibility) relative to the immovable plate.

Turning now to the references and in particular to the patents to Yun, the patent to June discloses an electric condenser microphone, which has nothing to do with the seismic sensor. As explained herein above, a diaphragm in this microphone is displaced exclusively under the action of air waves caused by an acoustic event. The applicants prior art described in the specification discloses exclusively a seismic sensor with a core having a winding and movable in an electromagnetic field under the action of seismic activity. Thus, this prior art applied by the Examiner has nothing to do with the seismic sensor of the present invention which includes a thin, flexible, movable diaphragm moveable relative to the immovable plate.

The patent to Bennett which is mentioned in the Office Action discloses a seismic sensor. However, it operates in a completely different principle. In the seismic sensor there are cantilever beams extending from the periphery of the sensor towards its center, and only on the inner ends of the cantilever beams there is a small seismic element or elements. Thus here there is no thin flexible diaphragm which extends completely over the whole cross-section of the sensor and its case, and instead in the reference only in its center there is an additional mass increasing element which enhances the displacement of the thin flexible diaphragm relative to the immovable plate.

Thus, the patent to Benet does not teach the new features of the present invention.

As for the combination of the references, it is believed that this combination first of all can not be considered as obvious for a person of ordinary skill in the art. The primary reference of the Yun deals, as mentioned herein above, with an acoustic sensor or an acoustic microphone in which one plate is moved relative to the other plate exclusively under the action of air waves of an acoustic wave, while the patent to Bennet deals with a seismic sensor in which the seismic mass moves under the action of the seismic event which displaces the sensor as a whole. Thus, a person of ordinary skill in the art would not combine these references at all.

If however for some reasons the teachings of the references were combined, a resulting construction will be a seismic sensor of Yun which is modified by having a plurality of cantilever beams with a seismic mass in the center of the cantilever beams, and with an additional mass enhancing element on the central seismic mass. It is believed that this is just impossible, since as shown in the patent to Bennet the seismic mass is a very small piece 14, on which no additional mass enhancing element can be provided. Thus, the

present invention can not be derived from the combination of the patent to June or the applicant's admitted prior art with the patent to Ritter.

In order to arrive at the applicant's invention, the references have to be fundamentally modified. In particular, the construction disclosed in the reference have to be completely changed so as to include into them the new features of the present invention which are now defined in the amended claim 1. However, it is known that in order to arrive at a claimed invention, by modifying the references the cited art must itself contain a suggestion for such a modification.

This principle has also been consistently upheld by the U.S. Court of Customs and Patent Appeals which, for example, held in its decision in re Randol and Redford (165 USPQ 586) that

Prior patents are references only for what they clearly disclose or suggest; it is not a proper use of a patent as a reference to modify its structure to one which prior art references do not suggest.

The references however do not contain any hint or suggestion for such modifications.

It is however believed that claim 1 should be considered as patentably distinguishing over the art and should be allowed.

As for the rejection of the original claims over the combination of the patents to Ritter or applicant's in view of the prior art in combination with the patents to Wang and Cuculinsky, this rejection is not understood since the body of the Amendment has totally different references analyzed. Upon issuance of a new Office Action, applicant will attend to the rejection based on these references as well.

Reconsideration and allowance of the present application is most respectfully requested.

Should the Examiner require or consider it advisable that the specification, claims and/or drawings be further amended or corrected in formal respects in order to place this case in condition for final allowance, then it is respectfully requested that such amendments or corrections be carried out by Examiner's Amendment, and the case be passed to issue. Alternatively, should the Examiner feel that a personal discussion might be helpful in advancing this case to allowance, he is invited to telephone the undersigned (at 631-243-3818).

Respectfully submitted,


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Please extend the term for
response by 1 month and
charge to 26.0085.

